



## MATH APPLICATION ACTIVITY:

### Using Sound Waves to Study Climate Change

#### OBJECTIVES: Students will:

- + Describe the characteristics of sound waves and their movement through different mediums;
- + Analyze the relationship between the speed of sound in water and temperature;
- + Illustrate the uses of acoustic monitoring in global change research;

#### MATERIALS:

- + **Student Sheets**,
- + calculator,
- + paper/pencil, ruler,
- + world atlas,
- + graph paper;

#### PROCEDURE:

1. Read and discuss the background information on pages 1-2.
2. Students should try calculating the answers to the problems in **ACTIVITY 1** using the information found in the reading selection.
3. Using the information in **DATA TABLE 1**, students should plot a line graph showing how the speed of sound in air varies with temperature. They should then answer the **ANALYSIS** questions for this section.
4. Direct students to **DATA TABLE 2**. Review the layout and the information included.
  - Instruct students to round the numbers in the **Depth** column (A) and record them in column B.
  - Instruct students to round the number **Velocity** column (C) to the nearest whole number and record them in column (D).

## Teacher Sheet 2

- Instruct students to complete column E in the **DATA TABLE** using the following procedure:
  1. Refer to the Temperature given for 44.60 m depth ( $5^{\circ}\text{C}$ ).
  2. Use the following information and calculate the water temperature for each depth based on the sound velocities.

**NOTE: Water temperature increases  $5^{\circ}\text{C}$  for every 23 m/sec increase in the velocity of sound.**
  3. Record your computations in the column E.
  4. Answer the **ANALYSIS** questions using information from the reading and your data.

